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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/717,051

11/19/2003

Richard R. Bijjani

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10/07/2004

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EXAMINER

HO, ALLEN C

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 10/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/717,051

Applicant(s)

BIJJANI ET AL.

Examiner

Allen C. Ho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>032004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 6, 7, 10-15, and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Krug *et al.* (U. S. Patent No. 5,838,758).

With respect to claim 1, Krug *et al.* disclosed a method for analyzing an object comprising: pre-scanning the object using a multiple energy x-ray device (1004) to determine information indicative of effective atomic number characteristics of the object (column 1, lines 18-22); transmitting the information to a processor (a computed tomography device would necessarily have a processor) coupled to a computed tomography device (1004); and conducting scans of areas of interest of the object with the computed tomography device based on the information (column 32, lines 18-44).

With respect to claim 6, Krug *et al.* disclosed the method of claim 1, further comprising using the information to determine density characteristics of the object (since the linear absorption coefficient is proportional to the density).

With respect to claim 7, Krug *et al.* disclosed the method of claim 1, further comprising using the information to determine a plane of the object to be scanned (column 32, lines 32-35).

With respect to claim 10, Krug *et al.* disclosed an apparatus for analyzing an object comprising: a multiple energy prescanner (1004) that prescans the object; and a computed tomography device (1004) that scans areas of interest of the object based on information indicative of effective atomic number characteristics of the object transmitted from the multiple energy prescanner.

With respect to claim 11, Krug *et al.* disclosed the apparatus of claim 10, wherein the multiple-energy prescanner has a high-energy x-ray source and a low-energy x-ray source (dual energy).

With respect to claim 12, Krug *et al.* disclosed the apparatus of claim 10, further comprising a conveyor (5) for transporting the object from the multiple-energy prescanner to the computed tomography device.

With respect to claim 13, Krug *et al.* disclosed the apparatus of claim 10, wherein the computed tomography device is a multiple-energy computed tomography device (column 32, lines 38-40).

With respect to claim 14, Krug *et al.* disclosed an apparatus for analyzing an object comprising: a multiple-energy prescanner (1004); and a computed tomography device (1004), wherein information indicative of at least one metal artifact is transmitted from the multiple energy prescanner to the computed tomography device (since they are implemented as a single unit).

With regard to claim 15, Krug *et al.* disclosed the method of claim 1, wherein transmitting the information comprises transmitting the information to a processor coupled to a

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computed tomography device, the computed tomography device comprising a portion of a unit that also comprises the multiple energy x-ray device (column 32, lines 38-44).

With regard to claim 18, Krug *et al.* disclosed the apparatus of claim 10, wherein the multiple energy prescanner and the computed tomography device are implemented as a single unit (1004).

With regard to claims 19 and 20, Krug *et al.* disclosed the apparatus of claim 10, wherein the information indicative to effective atomic number characteristics of the object is updated based on second information generated by the computed tomography device (the presence of the second information automatically updates the information indicative to effective atomic number characteristics of the object), wherein the second information is indicative of density characteristics of the object (since the linear absorption coefficient is proportional to the density).

Claim Rejections - 35 USC § 103

3. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758) as applied to claim 1 above, and further in view of Tuy (U. S. Patent No. 5,243,664).

With respect to claim 3, Krug *et al.* disclosed the method of claim 1. However, Krug *et al.* failed to teach performing a metal artifact correction based on the information.

Tuy disclosed a method of correction for metal artifacts. Tuy taught that a CT image, which includes metallic objects, would have severe artifacts (column 1, lines 18-30).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to performing a metal artifact correction based on the information, since a person would be motivated to obtain a CT reconstructed image that is free of metal artifacts.

With respect to claim 4, Krug *et al.* in combination with Tuy disclosed the method of claim 3, wherein performing a metal artifact correction includes performing a beam hardening correction (Tuy, column 2, lines 42-52).

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758) and Tuy (U. S. Patent No. 5,243,664) as applied to claim 3 above, and further in view of Timmer (U. S. Patent No. 5,905,809).

With respect to claim 5, Krug *et al.* in combination with Tuy disclosed the method of claim 3. However, Krug *et al.* and Tuy failed to teach performing a scatter correction.

Timmer disclosed a method for correcting scattered x-rays for computed tomography. Timmer taught that scattered x-rays cause image artifacts (column 1, lines 43-44).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform a scatter correction, since a person would be motivated to obtain a CT reconstructed image that is free of artifacts.

5. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758) in view of Tuy (U. S. Patent No. 5,243,664).

With respect to claim 8, Krug *et al.* disclosed a method for analyzing an object comprising: pre-scanning the object using a multiple-energy x-ray device (1004) to determine prescan information; transmitting the prescan information to a processor (a computed tomography device would necessarily have a processor) coupled to a computed tomography

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device (1004); performing a computed tomography scan of a plane of the object based on the prescan information (column 32, lines 35-37).

However, Krug *et al.* failed to teach performing a metal artifact correction on the computed tomography scan based on the prescan information if the plane intersects an area including or near a metal object.

Tuy disclosed a method of correction for metal artifacts. Tuy taught that a CT image, which includes metallic objects, would have severe artifacts (column 1, lines 18-30).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to performing a metal artifact correction on the computed tomography scan based on the prescan information if the plane intersects an area including or near a metal object, since a person would be motivated to obtain a CT reconstructed image that is free of metal artifacts.

With respect to claim 9, Krug *et al.* in combination with Tuy disclosed the method of claim 8, wherein the processor is located within the computed tomography device.

6. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758) as applied to claim 1 above.

With regard to claims 16 and 17, Krug *et al.* disclosed the method of claim 1, wherein conducting scans comprises conducting scans of areas of interest of the object with the computed tomography device based upon the information to determine second information indicative of density characteristics of the object (since the linear absorption coefficient is proportional to the density); and transmitting the second information to a processor (a computed tomography device would necessarily have a processor).

However, Krug *et al.* failed to teach transmitting the second information to a processor to determine whether to modify the information indicative of effective atomic number characteristics of the object.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the information indicative of effective atomic number characteristics of the object based on density characteristics of the object, since a person would be motivated to precisely identify the object based on both effective atomic number characteristics and density characteristics of the object as the combined information further narrows down the range of possibilities.

Response to Arguments

7. Applicant's arguments filed 23 July 2004 with respect to the specification have been fully considered and are persuasive. The objection of specification has been withdrawn.

8. Applicant's arguments filed 23 July 2004 with respect to claims 8 and 12 have been fully considered and are persuasive. The objection of claims 8 and 12 has been withdrawn.

9. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Applicants argue that Krug *et al.* failed to teach transmitting the information indicative of effective atomic number characteristics of the object to a processor coupled to a computed tomography device. In response, the examiner has modified the rejection using a single unit (1004) that comprises a multiple energy x-ray device and a computed tomography device.

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Thus, any information obtained by the multiple energy x-ray device is automatically transmitted to the computed tomography device since they share the same processor.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen C. Ho
Patent Examiner
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04 October 2004